


# Physical Exposure vs Mental Stress: *Explaining Psychological Symptoms Following the 9/11 Terrorist Attacks*



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# Previous Research

## multivariate predictors of symptoms

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- Galea et al. 2002 (survey 1 month after event)
  - *PTSD* and *depression* higher below Canal St than below 110<sup>th</sup> St
  - *PTSD* Predictors: Hispanic,  $\geq 2$  prior stressors, panic attack, low social support, death of friend/relative during attacks, loss of job due to attacks
  - *Depression* Predictors: Hispanic,  $\geq 2$  prior stressors, panic attack, loss of possessions due to attacks
- Galea et al. 2003 (survey 6 months after attack)
  - *PTSD* dropped from 7.5% at 1 month to 0.6 at 6 months
  - *Current Probable PTSD* Predictor: loss of job due to attacks



# Current Research Questions

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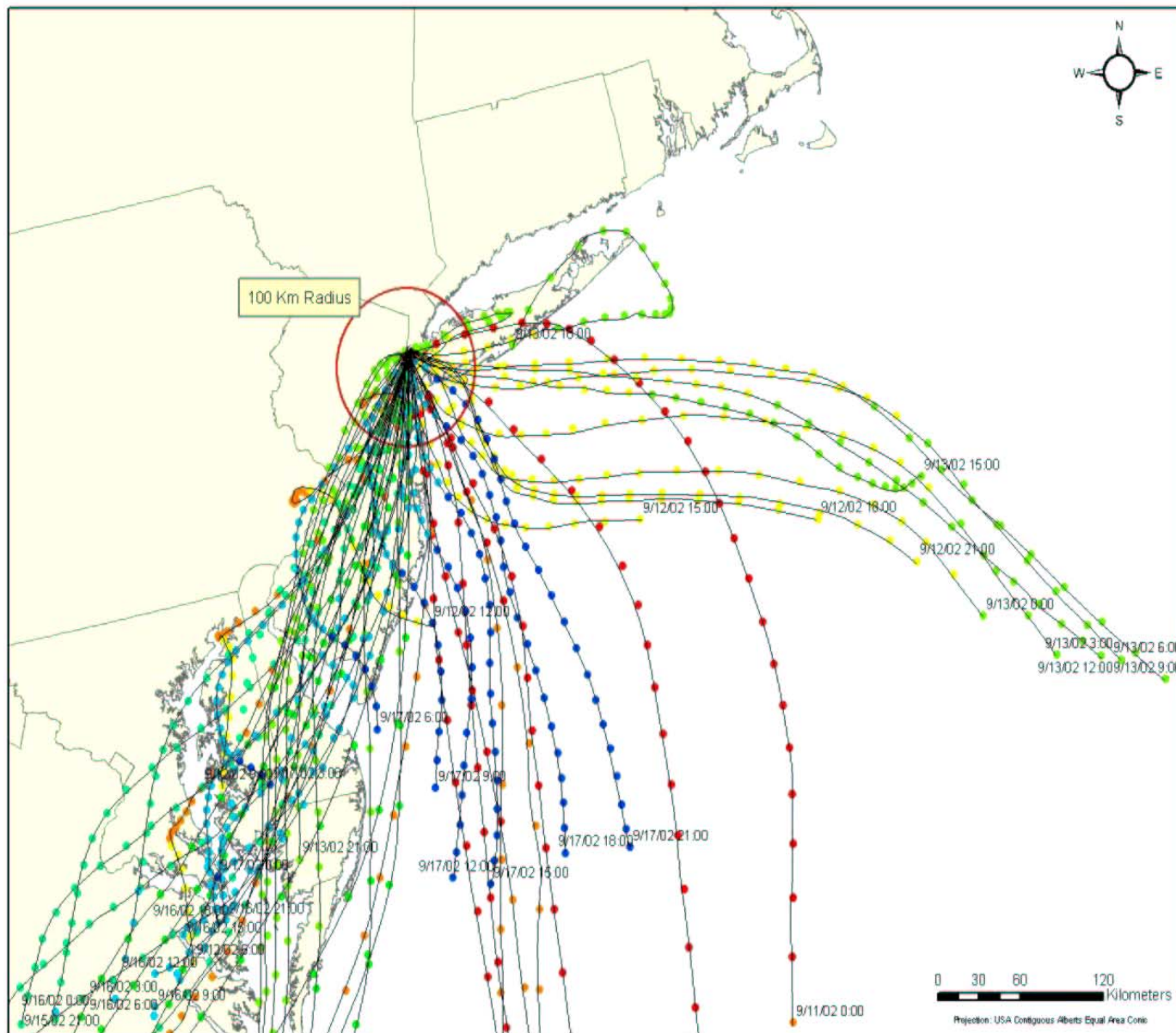
- Do quantitative exposure estimates improve prediction of *PTSD* and *Depression* symptoms
  - Within Manhattan
    - Or is residence south of Canal St. sufficient?
  - In the New York Metropolitan Area
- What is the prevalence of new onset *asthma*?
  - Does new onset *asthma* vary by region?
  - What are predictors of new onset *asthma*?



# Methodologic Approach

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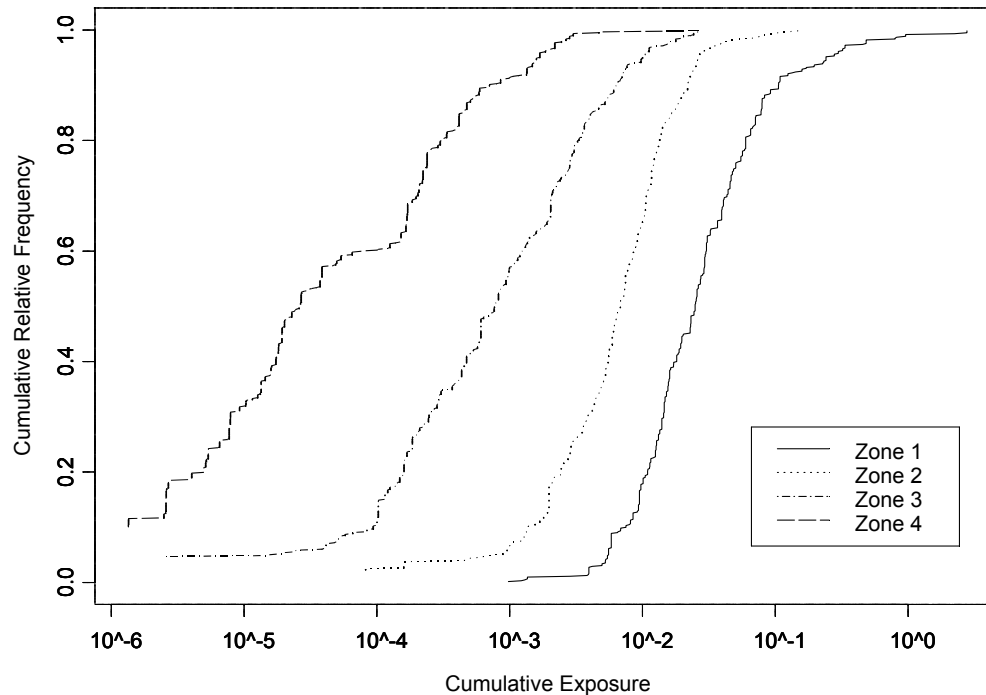
- Statistical exploration of exposure data
- 2x2 Tables
- Scatterplots with smoothed trend lines
- Logistic regression with interaction



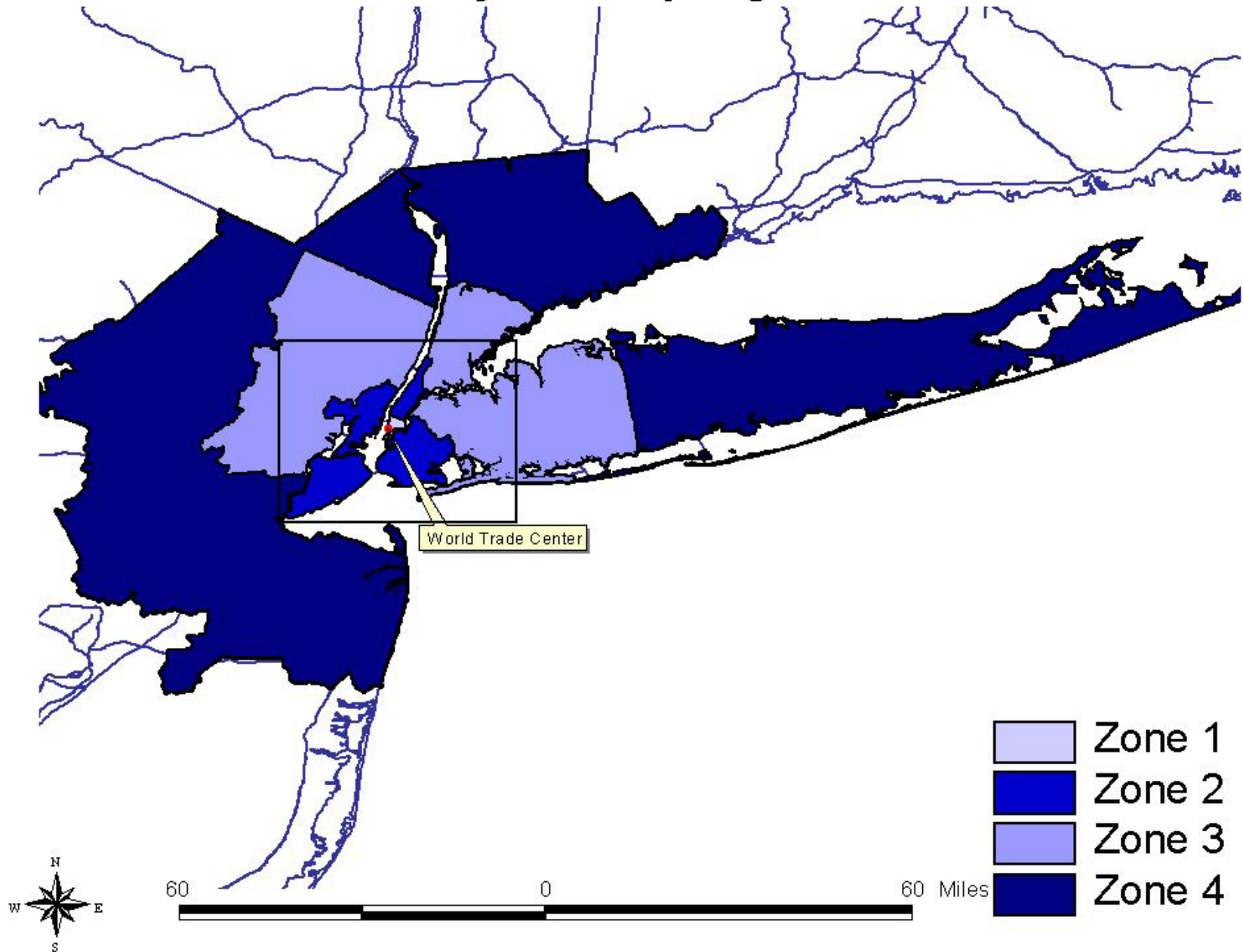
**Figure 2. 24-hour forward air parcel trajectories originating from the WTC site every 3 hours for a week, starting on 9/11/01 (first day in red)**

# Exposure Distribution

- Zone 1: Manhattan, south of 14<sup>th</sup> Street
- Zone 2: rest of Manhattan, Brooklyn, Staten Island, and Hudson County (NJ)
- Zone 3: Bronx, Queens, close parts of NY, NJ
- Zone 4: Further parts of NY, NJ, CT



## Survey 3: Sampling frame





# Exposure Statistics

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- Zone 1: Manhattan, south of 14<sup>th</sup> Street
- Zone 2: rest of Manhattan, Brooklyn, Staten Island, and Hudson County (NJ)
- Zone 3: Bronx, Queens, close parts of NY, NJ
- Zone 4: Further parts of NY, NJ, CT

Quantile	Zone 1	Zone 2	Zone 3	Zone 4
Minimum	9.797E-4	0	0	0
25 <sup>th</sup>	1.278E-2	2.904E-3	1.853E-4	6.553E-6
Median	2.492E-2	6.833E-3	7.679E-4	2.663E-5
75 <sup>th</sup>	4.946E-2	1.174E-2	2.820E-3	2.232E-4
Maximum	2.780E0	1.517E-1	2.758E-2	2.655E-2
# Obs	619/669 (92.5%)	640/750 (85.3%)	597/669 (89.2%)	606/667 (90.9%)





# Preliminary Result

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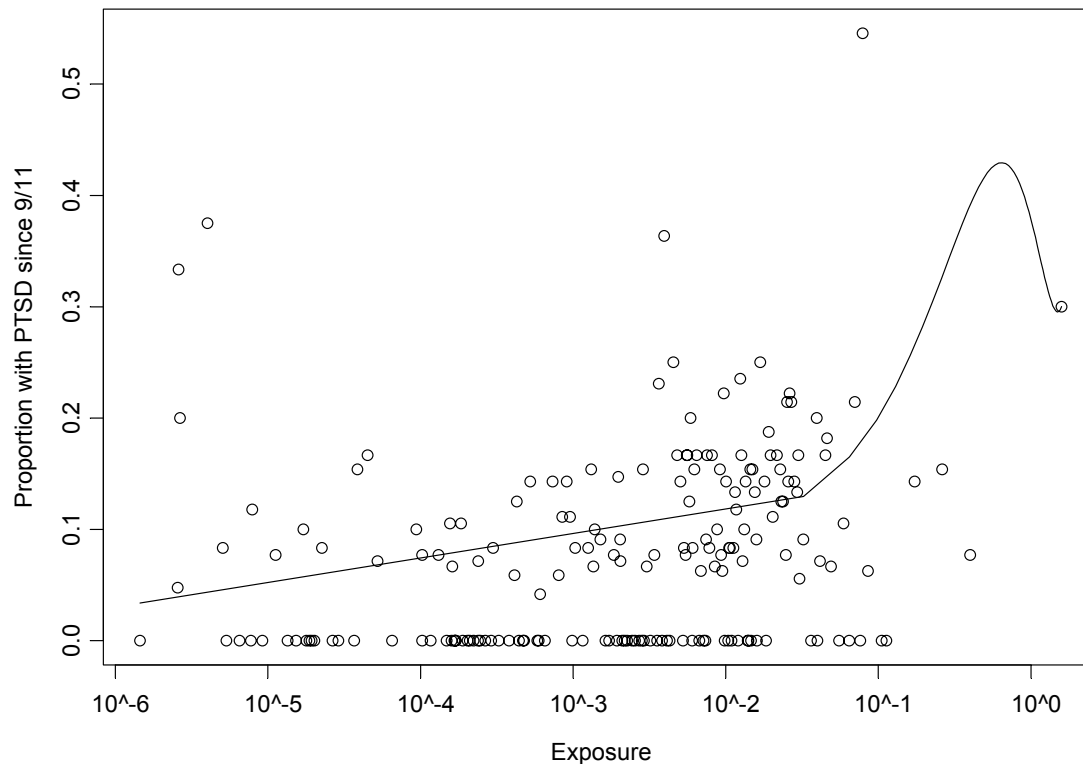
- 2x2 Table (unweighted and unadjusted for confounding)

	No PTSD	PTSD	
Not Exposed	2000	142	2,142
Exposed	538	75	613
TOTAL	2,538	217	2,755

**OR=2.0 (1.5-2.6)**

# Preliminary Result

- Smoothed Scatterplot (unweighted and unadjusted for confounding)





# Next Steps

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- Complete preliminary analyses
- Continue multivariate modeling (logistic)
  - Identify relevant confounders
  - Consider possible effect modification
  - Assess nonlinear and/or non-monotonic patterns
- Summarize results